UDC 711

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REFLECTION OF THE PAST IN THE MODERN DEVELOPMENT: USOLYE CASE STUDY

Abstract: *The article presents the study of a historic area of Usolye town, its transformations and development from the main salt production centre in the Urals in the 18th-19th centuries to the decayed historic architectural complex at present. The objectives of the research were to understand the transformations of the area: factors influencing the development of the locality, the transition from the past to the present, the elaboration of identification and classification methods for the architectural complex. Multiscale study of Usolye using census instrument adopted the following methods: general territory study; census database creation; synthesis of the data in a form of thematic maps; study of certain layers: ruins examination and buildings detailed study. The obtained results include the census database of 71 buildings and structures, a remote sensing historic analysis map, the examination of ruins, several detailed studies of typologies and thematic maps of Usolye. The integrated methodology of research, precise digital measurements and perceptive investigation were used to access the state of the complex nowadays. The data obtained is a base for the further conceptions of development and preservation of the historic sites of Usolye and Upper Kama Region.*
Keywords*: Usolye, historic architectural complex, census, documentation, remote sensing analysis, thematic maps, database.*

1. Introduction to Usolye and Upper Kama architecture phenomenon

At the present moment it is possible to notice a fast degradation and abandonment of the rural environment throughout Russia, which is the last stronghold of the provincial architectural tradition (Ponomarenko, 2009). Its losses are deeply felt in the Urals, known as a natural territory, which preserves numerous examples of vernacular stone architecture. The wealth of mineral resources and the nature of the Urals has identified unique features of economic and cultural development of the region, therefore the uniqueness of architectural traditions.

Upper Kama architecture, influenced by specific local conditions (natural, historical, economic, ethnic, etc.), emerged as a unique phenomenon at the crossroads of different cultures. In addition to the developing industry, mainly mining and construction, the influence of metropolitan trends brought by western merchants, it was also determined by the artistic traditions of the Russian North and Central Russia.

Tangible and intangible heritage of the cross-cultural origin of the region is still widely present along the Upper Kama. Usolye is one of the three main elements (together with Cherdyn' and Solikamsk) in the urban structure of historic Upper Kama localities. These three towns represent the best examples of cross-cultural integration, each being authentic and forming a cultural code of Prikamye identity.

It is essential to document valuable historic sites as documentation not only serves as a valuable source of reliable data for further research and rehabilitation activities for the locality, but also provides an actualised image of the site at a certain moment of the time and disregarding further circumstances let it remain in our memory as a testimony of previous generations culture and development.

The historical and cultural value of Usolye is determined by the combination of vernacular culture added on by Russian traditions and West European peculiarities, defining the origin of historical layout of many old villages and towns and preserving natural landscapes and numerous monuments of authentic architecture, historical and archaeological sites.

Being an authentic and idiosyncratic territory, Usolye has rich culture and history and retains a great amount of unacknowledged architectural heritage witnessing gradual dilapidation.

The history of Usolye is a continuation of the history of the Stroganovs House, one of the stages of its extensive and vigorous trade and commercial activities closely associated with the development of salt industry in Russia (Kostochkin, 1988).

Usolye (from Russian [sol'], Eng. Salt) is a town and the administrative centre of the Usolsky District in the Perm Krai, Russia, located in the so-called Upper Kama District on the right bank of the Kama River, opposite of the city of Berezniki and 180 kilometres north of Perm, the regional capital (Fig.1). The population of Usolye is 6,236 people (Census, 2017).

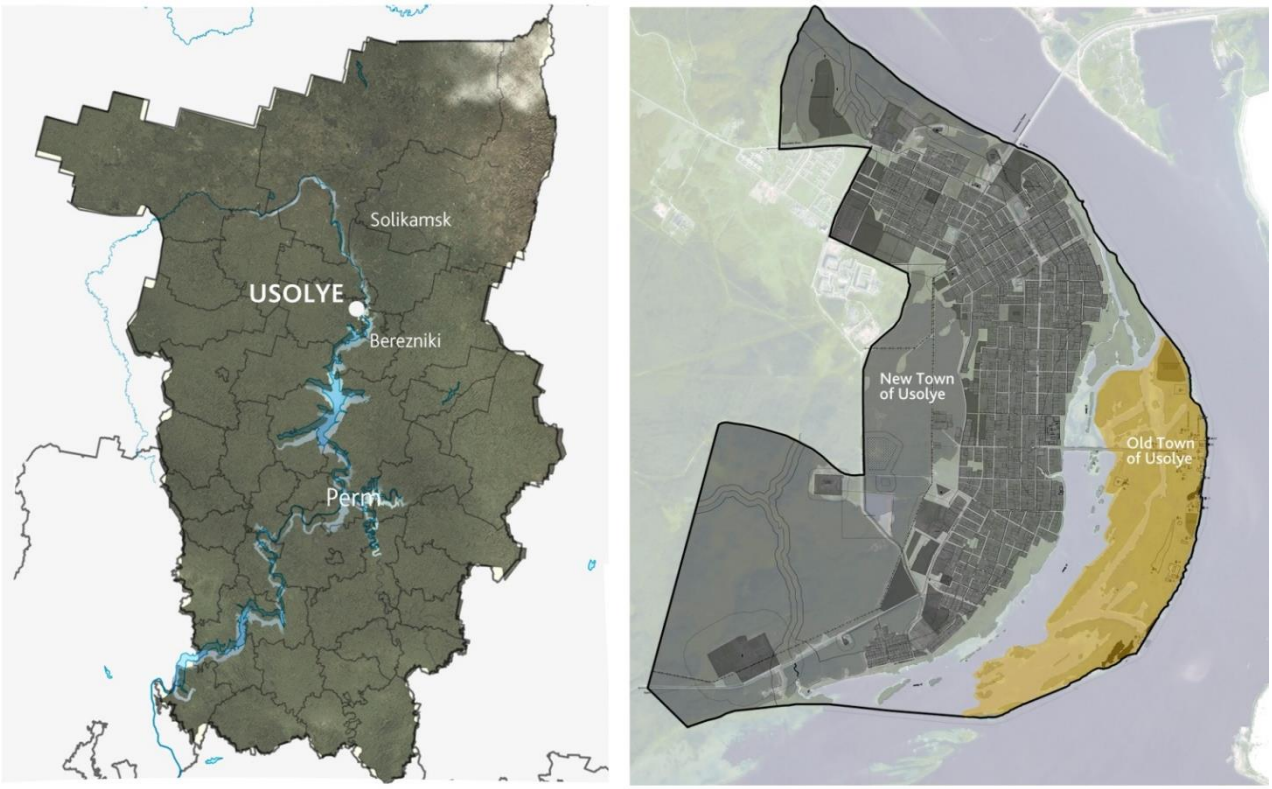

Figure 1. Geographical location of Usolye

1.1 History overview

Intense urban and architectural development of the territory started in the 16th- 17th centuries when feudal relations were finally formed in the Kama region. Merchants Stroganovs, firstly just "famous people" and then counts and barons became the most influential feudal lords. The Stroganovs brought about a continuation of the history of the Stroganovs House to Prikamye, and one of the stages of its extensive and vigorous trade and commercial activities closely associated with the development of salt industry in Russia. They developed the territory culturally and gave an impulse to proper urban development.

Usolye was established in 1606 by Stroganov family in an area rich in salt springs as the centre of their rapidly expanding salt production empire on the Kama River. The Stroganovs had already become Russia's leading producers of salt through their operations centred at the northern town of Solvychegodsk and owned all the salt mines in the Urals. Their salt production activity

not only made them important political and business figures of the time, but also contributed to the emergence of unique cultural and architectural traditions and flourishing settlements from the architectural point of view. The settlement of Usolye was intended to consolidate their ability to tap the resources of recently opened territories in the Urals (Brumfield, 2012). Until the end of the 18th century, it remained the Stroganov family's main locality on the Kama River. It grew into a major salt mining centre by the beginning of the 19th century (Kostochkin, 1988). In 1895, there were forty salt wells, which was the biggest salt production locality at the time.

The last half of the 19th century became the most prosperous period for Usolye. The town was famous for trade, and well-equipped saltpans particularly. In the words of a contemporary Usolye consisted of "magnificent temples ... a large population, large stone buildings and constantly reappearing buildings" (Kostochkin, 1988).

During the Soviet period, after the Revolution of 1917, which was characterised by the destruction of the nobility, the town quickly began to decay. Salt has lost its value. Berezniki chemical giant started to rapidly grow on the opposite to Usolye riverbank due to the new industrial goals of the country. The filling of Kama Reservoir in 1954-56 left the Old Town of Usolye nearly abandoned and by the end of the century it turned into a forgotten territory with the rich history.

2. Usolye urban structure development

The urban structure of Usolye is an outcome of multiple factors, influencing its formation throughout the history, having its own unique identity, which was formed due to continuous processes of the environment transformations and complex conditions of its development.

The transformation of the urban fabric of the city was not only correlated to the economic development of the settlements with salt works, but also to the natural factors: climate and terrain features. New Usolye was located on the lower bank of the Kama River on wetlands with marshy soils and was cut with Kama oxbows, which determined the structure of the settlement. The town was elongated from north to south, along Kama waterline. The territory was flooded during spring and summer water level rise and resolved into separate islands (Fig.2). Therefore, location for major religious, industrial, administrative and residential buildings was chosen not only according to compositional expressiveness and contemporary urban planning rules and traditions, but also on a higher level and stable soils considering the flooding risk. Salt works and piers were placed closer to the river for easy transportation; saltpans were constructed on the riverside territories due to production technology.

Figure 2. Flooding in Usolye, the 20th century

The essential factor that influenced the development of Usolye dually was the decree of Peter I on the prohibition of stone building in 1714 anywhere in Russia except for St. Petersburg. Only the Stroganov family being attendants of the Emperor was granted the permission to avoid the

decree. Thus on one side the Stroganovs used that opportunity to erect the most interesting architectural object of Usolye – the architectural ensemble of the Stroganovs Chambers, the Transfiguration Cathedral and the Bell Tower and other stone buildings later, which contributed to the formation of the architectural image of the town (Fig.3).

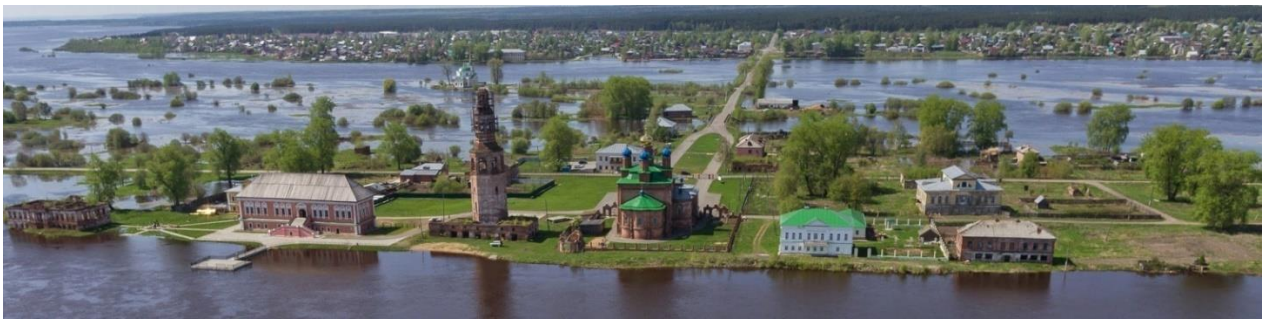

Figure 3. Panoramic view of Usolye waterline from Kama River, second half of the 20th century (website: fpw.perm.ru)

On the other hand, as the majority of built structures remained wooden the decree of Peter I resulted in many fires, which also destroyed the earlier wooden buildings, including first wooden churches of Usolye, and to alterations that affected the town structure. After the fire of 1753 the layout of New Usolye town changed dramatically: the streets became relatively wide following straight lanes. There were two new suburb areas (quarters) introduced: Kapustnaya (Kapustninskaya) and Permskaya, where the fire victims have been resettled. The area occupied by the village increased significantly. According to the plan of 1809 drawn after one of the major fires Usolye took shape of the town structure finally (Bushmakina, Yu.V. 2017). It should be noted that since then Usolye can be conditionally divided into the following parts: residential and administrative, i.e. Posad, the central part where the houses of the owners were located, and two industrial: Verkhnezavoskaya (between Pikhtovaya and Rubezhskaya Sloboda) and Nizhnezavoskaya (between Posad and Kamskaya Sloboda), around which philistine structures of salt workers were located (Fig.4).

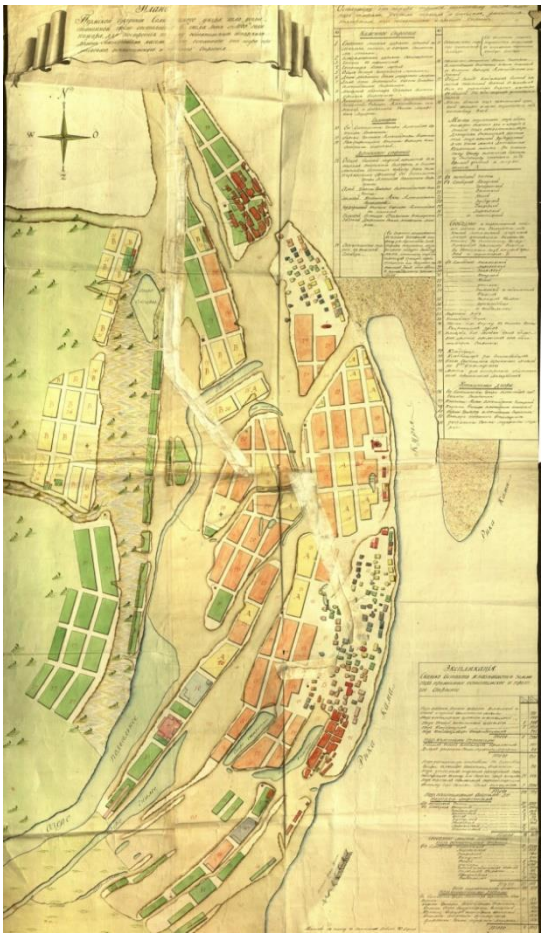

Figure 4. Plan of Usolye, 1809

2.1 Contemporary Usolye

Today on the territory of the Usolye island there are 37 monuments. Most of the objects are decayed or ruined. Most of the monuments and ensembles are located in the former Posad Area in the centre. There is only one object (Rubezhskaya church) located in Rubezhskaya Area on the north. Industrial buildings of the Verkhnezavodskaya, which also were located in the Rubezhskaya Area, are completely lost. There are partially preserved ancillary buildings remaining in the territory of the Nizhnezavodskaya part: ‘pripasnye’ (supply) barns and blacksmith shop (Kiselev and Yakina, 2011) (Fig.5).

Figure 5. Map of contemporary Usolye (with buildings)

Because of the lack of financing throughout several decades the condition of the majority of buildings have become very poor. At present the destiny of the Architectural complex is obscure. Whereas certain monuments are taken care of, others are left behind without any certain future and the possibility of improvements.

Due to the fact that at the end of the 20th century business activity re-emerged on the island, restoration works began. The Golitsyn estate was the first architectural complex to undergo restoration and on July 1, 1988 Prince Golitsyn Manor museum was founded. In connection with the organisation of the convent on the territory of Usolye in 1999 restoration of religious buildings began. In 2002 the Stroganovs Chambers historic architectural museum was initiated in Stroganovs Chambers, which was renovated in 2010 and restored to the original look. The House of Bragin museum was founded in 2012.

The emergence of religious, cultural and educational institutions on Usolye territory contributed to its rapid promotion. Festivals, rich history and the Stroganov family involvement in Usolye former prosperity attracts tourists from around the world. In the process of increasing the exploitation of the complex, the challenge of its further existence as one of the most significant attractions of the Perm Krai becomes relevant.

The island part territory of Usolye fully falls under the restrictions of archaeological heritage and since the 1950s several archaeological investigations (excavations in 1958, 1988, 1998 and the beginning of the 21st century) were performed on the territory of the settlement. There were multiple research works conducted for the conservation, restoration and reconstruction of monuments by Russian restoration ateliers in Moscow, Perm and Ekaterinburg, which mostly remained on paper. In the 20th century Perm Scientific Restoration Atelier was carrying out inventories, documentations, the majority of surveys, conservation and restoration projects for the Upper Kama region. The survey of Usolye conducted by Perm Scientific Restoration Atelier in 1986 provides the reliable data about the majority of the existing monuments of the complex.

The recent study of Upper Kama architecture was made by W. Brumfield in a form of photographic survey “Solikamsk: Architectural Heritage in Photographs” (2007), “Cherdyn: Architectural Heritage in Photographs” (2007), “Usol'e: Architectural Heritage in Photographs” (2012).

At present the Perm Regional Centre for Monuments Protection is in charge of Upper Kama heritage preservation. There is the 'Usolye protection zones' project (2016) in progress made for the preservation of the architectural complex.

3. Census: multi-layered study of Usolye

Architecture and Urban Planning department of Perm National Research Polytechnic University in collaboration with the University of Pavia has started research and survey activities in Usolye in 2015[i]. The study is aimed at the implementation of contemporary approaches to the surveying and preservation of architectural heritage creating a set of graphic and documentary materials and recommendations to help preserving the unique historic-architectural complex and comprised traditional documentation activities combined with remote-sensing survey technics: laser scanning and photogrammetry (Bertocci 2004, Parrinello 2014), (Parrinello, Maksimova, Sosnovskih, Shamarina and Mezenina 2015), (Letellier 2012). The materials obtained include the study of the landscape, inventory of historic architectural buildings, detailed 3D modelling of the Stroganovs ensemble and other monuments, 3D representation and 2D drawings of the Ensemble performed with the use of laser scanning technology. Accurate surveying operations constitute the fundamental basis for critical analysis of the formation and development of an architectural element, complex, cultural landscape or locality, as well as for the planning of interventions for the future actions: conservation, restoration and exploitation of an urbanised area.

One of the key points of the study is the statement that not only single monuments define the historic and cultural value of the locality but the complexity of authentic architecture and other elements that create certain urban environment. The solution to understand the whole was to create a comprehensive research system where each element of the complexity could be identified and studied individually and after several analytical operations perceived as a synthetised component.

The research is intended at the creation of a digital database that describes architecture, structure and landscape features of the unique architectural complex. Thus, the present paper focuses on a census method of documentation as a way to study existing entity of elements, understand how it is used and what is preserved, identify constructions, typologies, details and find the links to the historic image of the place.

The objective of census elaboration of the Usolye historic-architectural complex and its natural surroundings is to determine such aspects as typology, appearance, physical characteristics and condition, analysis of damages as well as the cultural value that, integrated and interpreted, can help to identify critical management factors. Census study implied not only creating a database including every architectural element but implicated a multi-layered survey, which consisted of several stages and three different scales of investigation.

3.1 Study of the area

The first stage of the study was the examination of the island territory structure in general. It included perceptive analysis in the field and remote sensing analysis of the plans (Fig.6).

Remote sensing historical analysis showed interesting results. The analysis was made using actual cartographic data (Google maps 2016) with comparison to older plans (1809, 1842) and historic photographs of Usolye. Plans were adjusted to one scale, put on top of each other and compared metre by metre. Contemporary images suggest traces of the structures completely ruined at the moment only with foundation or its parts preserved. The analysis showed that there were lines and other geometric shapes suggesting presence of architectural structures and transport infrastructure in the past. They can be classified into three types: preliminary detected buildings, artificial water boundary and artificial geometry. There are especially many of them found in the former location of Verkhnezavodskaya (northern part of Usolye) and Nizhnezavodskaya (southern part of Usolye).

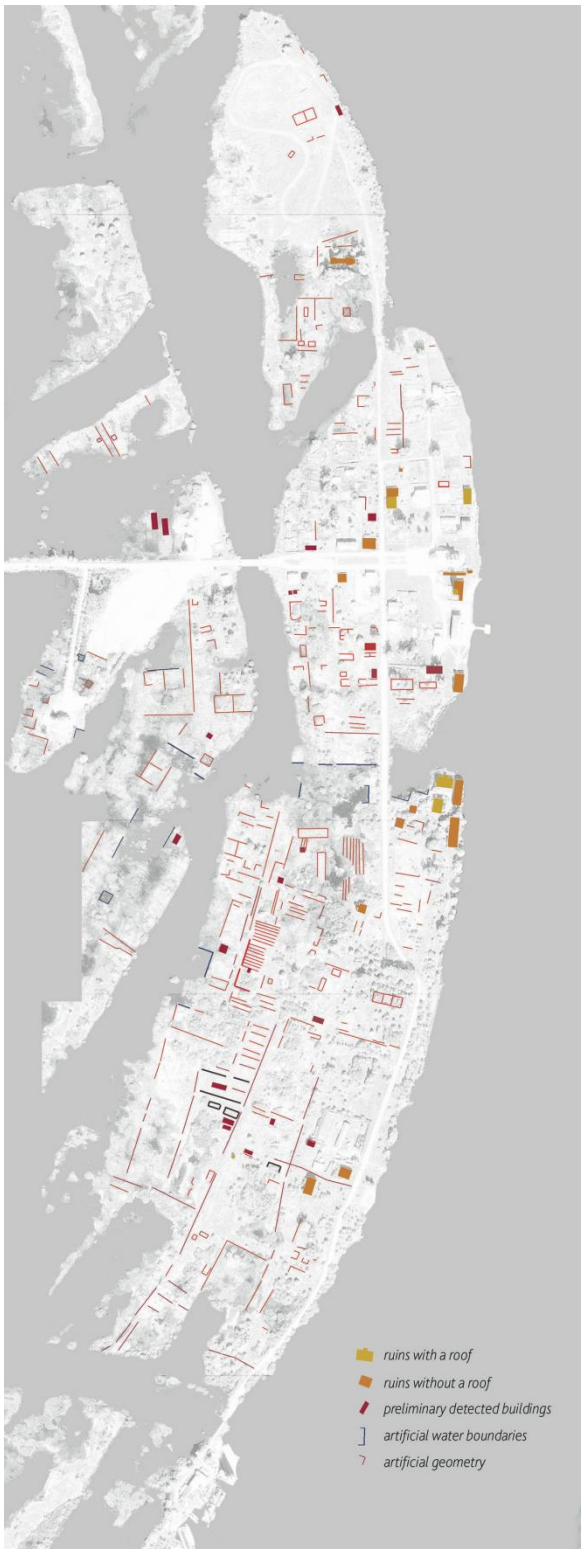

Figure 6. Remote sensing analysis of Usolye island territory, 2016

3.2 Study of the buildings

The next step of the research was the creation of a digital database of each building located on the territory. The present version of the database consists of 71 buildings including 37 monuments and 34 other buildings and structures.

The census schedule of the historic-architectural complex in Usolye is a collection of systemised data about each of the examined monuments of the complex and their surroundings

presented as a single document with a separate page for a monument. The database as a resulting format of this study is created with the help of the FileMaker software, designed to manage extensive amounts of data and present it in an appropriate way (Parrinello, Maksimova and Mezenina 2015).

The acquisition of data for the census purposes was performed after the creation of parameters system and involved field observations and documentary research. Field observations including several photographic campaigns of the monuments throughout the year and making notes and sketches of the monuments' current condition, as well as Usolye archival records granted by the Inspection for Control over the Protection of Cultural Heritage of the Perm Krai, Stroganovs Chambers Museum and Perm Scientific Restoration Atelier constituted the basis of the documentary materials.

Preliminary site observation and monuments inspection showed the necessity to develop a system of parameters focusing on the appearance, materials and physical condition of the historic complex buildings, which can provide an adequate assessment to its preservation status[iii]. A system of parameters for the database was created as a part of the census activity with a reference to the "Passport of the cultural heritage object" template developed by the Ministry of Culture of the Russian Federation in 2011 and the Guidelines on Cultural Heritage (technical tools for heritage conservation and management), 2012 developed by the Council of Europe and the practical solutions developed within the European project "Wooden Architecture: Traditional Karelian Timber Architecture and Landscape" case-study investigations[ii] (Vernizzi 2014). The need for the different documentation standard rather than using the legally approved Passport template was derived from the preliminary analysis of the document. The parameters listed there mostly concerned the legal matters of the monument, not giving the required attention to the external appearance, architectural-constructional characteristics or guidelines for taking only specific actions for its preservation according to relevant problems and risks.

Integrated into a single system 40 parameters were developed, divided and structured into five thematic sections: General information (13 parameters amended by site plan and general view picture); Historical information (3 parameters amended by historical pictures); Visual description (6 parameters amended by present appearance pictures); Architectural-constructional analysis (11 parameters amended by drawings/pictures of the facades, plans and sections); Risks/problems (7 parameters). These five sections organised in a sequence compose the layout of the census document (Fig.7).

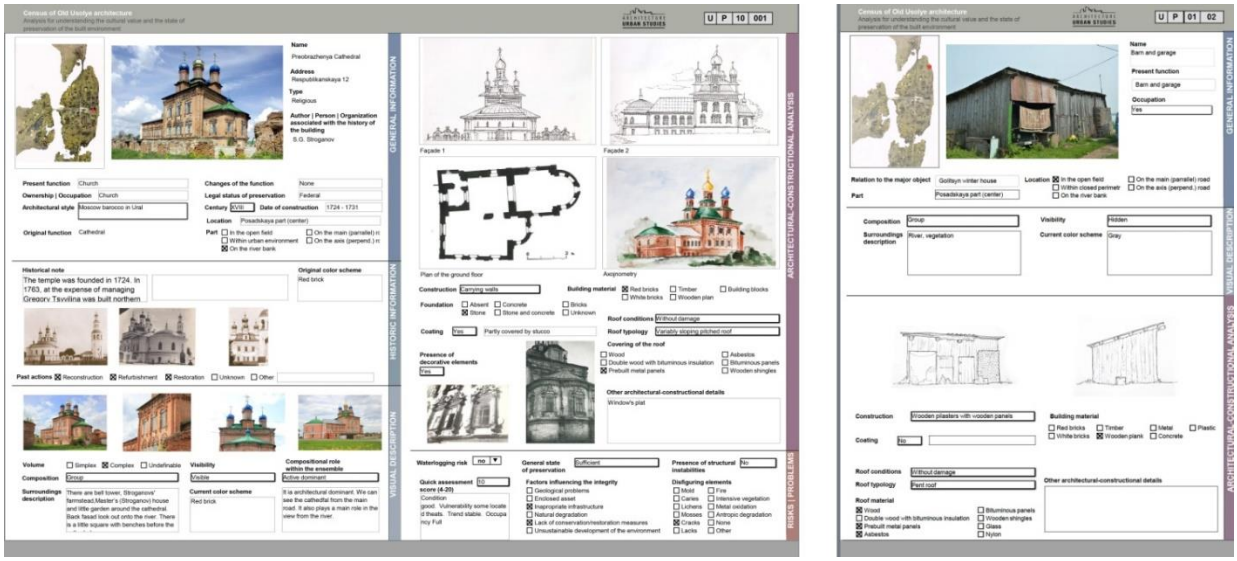

Figure 7. Census document layout

The layout design and the database were completed using the FileMaker software. Regarding the process of the census creation the first step involved gathering the various data, the second step included creation of the layout using the software and the third step consisted of filling in the layout with the data collected for each building. The determination of the monuments' physical condition was made according to the Physical condition evaluation scale developed for the case study of Usolye Historic-Architectural Complex (Bini and Bertocci 2012). Within this scale each architectural-constructional feature (foundation, walls, floor slabs, roof or decorative system) damage level was assessed and defined as 'excellent', 'good', 'fair', 'poor' or 'very poor' accordingly. The most serious damage found on any element of the building structure defines its overall physical condition.

3.3 Detailed study

The third stage of research activity in the framework of the census study was the detailed study. It implied research in a smaller scale focusing on typologies, architectural details, building materials, state of preservation of certain elements, etc. There were two types of analysis initiated: analysis of the certain layer, ruins study specifically and study of the certain buildings typologies: detailed study of the supply buildings complex (including Material Magazein), two residential buildings (Ivanov's Pharmacy (Fig. 8) and Former Saltworks Office Building) and one commercial building (Zhakov's store).

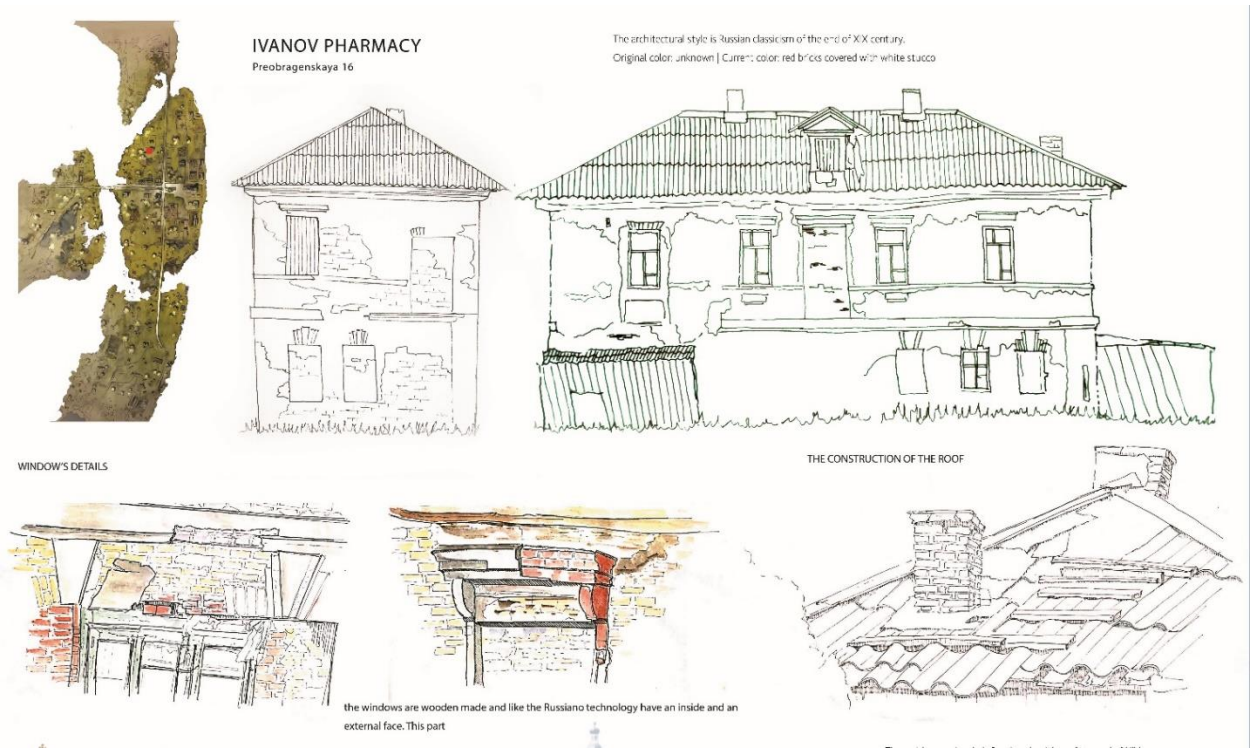

Figure 8. Detailed study of Ivanov's Pharmacy

Inventory of the ruins was focused on the central part of Posad Area. There were several remains of architectural objects found: three residential buildings, one coin shop and two chapels. They were identified using historical materials (plans, maps and documentaries), studied by the means of drawing and presented in comparison to their original photographs and a survey of 1986 (inventory performed by Perm Restoration Atelier) materials: photographs and plans, followed by a short historic review.

Inventory of the building typologies was made for four buildings. Typologies were chosen according to their cultural and historic value and ability to represent the locality.

A unique complex of supply barns with Material Magazein located in Nizovaya Area was chosen as a representation of industrial architecture of the 19th - 20th centuries.

Currently the complex is under the risk of destruction because of flooding. The investigation was focusing on architectural-constructional scheme of the building and implied large-scale technical drawings of facades and plans. Colour scheme of the buildings was documented using watercolour. The construction of foundation, walls and a roof of each building were studied by the means of the drawing, photographs and photogrammetry resulting in 3D models of the details. Typologies of construction, architectural details and decorations were listed and presented as sketches.

3.4 Thematic maps

Thematic maps elaboration is a process of combination of information from the census database and spatial information in a form of a plan. It is a tool that synthetises various types of data. All the collected data regarding the architectural elements found in the territory classified and put on a map and presented in a spatial context provides us with a different type of knowledge. The processed information recorded in the FileMaker database software combined with a digital territory plan allows creating the thematic maps of the town, contributing to analysing various aspects of the complex in spatial context as well as identifying the correlations between the elements.

Thematic map is a powerful instrument of understanding possible correlation between the elements, getting the general image of the territory and its landscape characteristics as well as developing a strategy for the measures to be taken. Each parameter analysed in the census database reflects the possible idea for a thematic map. The result of thematic maps survey activity is presented as a collection of analytical maps (e.g. functional map, cultural value map, roof construction map, state of preservation map) (Fig.9).

This survey activity is considered as one of the architectural survey methods allowing understanding connections and various features of the territory as a whole (Parrinello, Maksimova and Mezenina 2015).

Conclusions

The integrated methodology of research, combining traditional and modern methods (Bold, 2009), perceptive investigations and precise digital measurements, can be used to assess the state and condition of historic complexes and sites at a particular time, re-establish its cultural value and contribute to the development of the concept of preserving the authentic appearance of the architectural environment and planning processes of its transformation and valorisation.

Census digital database defines the landscaping and environmental aspects, as well as the diagnostic picture of each element within existing context and on the basis of its intrinsic characteristics, discovers possible untraditional elements, and as a result, finds the way to re-establish the correct structure of the place. This systemized collection of extensive data allows researchers to identify the surveyed elements and define the intervention priorities, underlining preferable ways for managing the site.

The database defines the landscaping and environmental aspects, as well as the diagnostic picture of each element within existing context and on the basis of its intrinsic characteristics, discovers possible untraditional elements, and as a result, finds the way to re-establish the correct structure of the place and to define the conditions for management and future development of the locality.

The documentation and investigation of Usolye using various methods in the framework of census research activity will help to create a cultural path that tries to reconnect information from different references and data acquisition methods to rebuild the image of Prikamye architecture and define the vision for Usolye and Upper Kama Region.

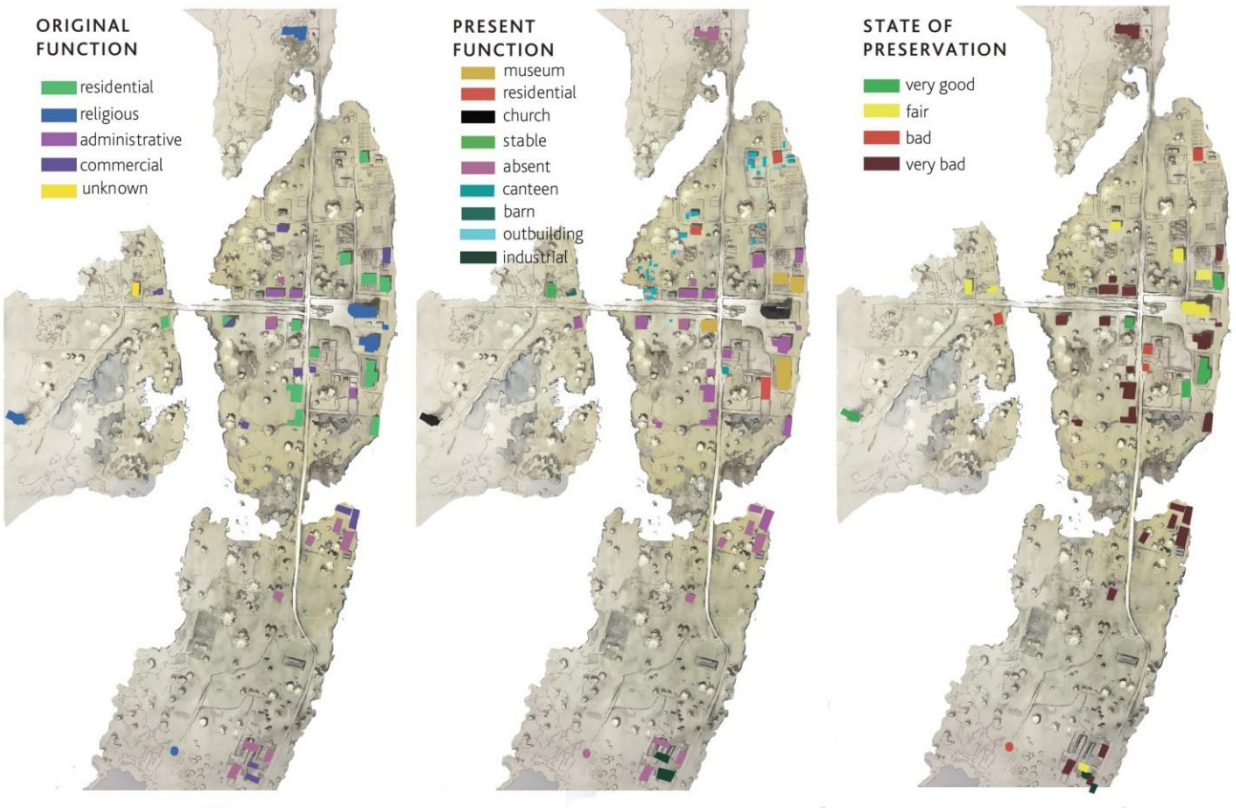

Figure 9. Thematic maps (from left to right: original function map, present function map, state of preservation map)

Notes

[i] Usolye Documentation project implemented by the Department of Architecture and Urban Planning of Perm National Research University together with the University of Pavia and Historic Architectural Museum "Stroganovs Chambers", 2015-nowadays.

[ii] European project 'Wooden architecture: traditional Karelian timber architecture and landscape' (2014) (http://cordis.europa.eu/project/rcn/102099_en.html) accessed 1th June 2016.

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